



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,043	09/15/2006	Werner-Holger Heine	2003P13456WOUS	7261
22116	7590	12/23/2009	EXAMINER	
SIEMENS CORPORATION INTELLECTUAL PROPERTY DEPARTMENT 170 WOOD AVENUE SOUTH ISELIN, NJ 08830			EASTMAN, AARON ROBERT	
		ART UNIT	PAPER NUMBER	
		3745		
		MAIL DATE		DELIVERY MODE
		12/23/2009		PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/593,043	HEINE ET AL.	
	Examiner	Art Unit	
	Aaron R. Eastman	3745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 23 September 2009.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 8-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 8-18 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ . |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: _____ . |

DETAILED ACTION

Response to Arguments

1. Applicants' arguments filed September 23, 2009 have been fully considered but they are not persuasive. Applicants argue that USP 6,152,697 (Konishi et al. hereinafter) teaches a second outer region (3) that does not have a Applicants' claimed second bearing surface and a fourth portion (4) which has this bearing surface, but that this fourth portion is not "abutting the second end face of the middle region" as claimed and that therefore Konishi et al. does not teach the limitations of the independent claims.
2. Examiner disagrees with this assessment of Konishi et al. as will be further discussed in the rejection below, portions (3) and (4) are reinterpreted as a single portion since they are of the same material and therefore the second outer region (3 and 4) has a bearing surface.
3. Applicants also argue that paragraphs [00011] and [00018] disclose that the limitations in claims 10-13 solve a stated problem. The limitations in claims 10-13 are as follows:

10. "...the middle region material is a forging steel having 9 to 12% by weight of chromium and the first and second materials are steels having 1 to 2% by weight of chromium."
11. "...the first and second outer region materials are different."
12. "...the middle region is exposed to steam at 550°C and 250 bar."
13. "...the middle region material is nickel based."

As Examiner stated in the rejection, paragraph 8 “Konishi et al. teaches the turbine shaft as claimed in claim 9, wherein the middle region material is a forging steel having 9 to 12% by weight of chromium (in re claim 10), wherein the first and second outer materials are different (in re claim 11), the turbine shaft as claimed in claim 11 (in re claim 12) and the turbine shaft as claimed in claim 8 (in re claim 13).” It does not appear that Applicants are arguing whether or not Konishi et al. discloses these limitations as asserted by Examiner.

4. Applicants are arguing Examiner’s assertion that “Applicant has not disclosed that having the first and second materials are steels having 1 to 2% by weight of chromium, the middle region is exposed to steam at 550°C and 250 bar or the middle region material is nickel based solves any stated problem or is for any particular purpose” (paragraph 8 of the Office Action dated June 23, 2009) and that paragraphs [00011] and [00018] disclose this. Paragraphs [00011] and [00018] read as follows:

[00011] The turbine shaft must meet particular requirements on account of the various temperatures of the steam. Heat-resistant properties are demanded in the inflow region of the high-pressure subturbine. High long-time rupture strengths under centrifugal force are required at the ends of the turbine shaft. Furthermore, good toughness properties and tensile strengths are desired.

[00018] The middle region is in this case produced from a forging steel having 9 to 12% by weight of chromium and the two outer regions are produced from steels having 1 to 2% by weight of chromium. By a forging steel having 9 to 12% by weight of chromium and a steel having 1 to 2% by weight of chromium being

combined, the problem of increasing long-time depletion under centrifugal force, occurring above specific parameters, such as, for example, high steam temperatures of more than 565°C, large rotor diameters and high rotational speeds, for example 60 Hz, is solved.

5. As can be seen in paragraph [00011], desirous properties are disclosed but a way in which to achieve those properties is not disclosed. As can be seen in paragraph [00018], a way is disclosed in which the apparatus has desirous properties under specific conditions (temperatures of more than 565°C and high rotational speeds, for example 60 Hz) which are not disclosed in any of claims 10-13.

Claim Objections

6. Claim 14 is objected to because of the following informalities: In claim 14 line 6 “from second bloc” should read --from a second bloc--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 14 and 18 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In claim 14, the limitation “...producing a

middle region from a middle bloc of a heat-resistant material" is not found anywhere in the specification. In claim 18 the limitation "...wherein the middle region material is a forging steel having 9 to 12% by weight of chromium and the first and second materials are steels having 3.5% by weight of nickel" is claimed. This combination is not found anywhere in the specification.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 8, 9 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by USP 6,152,697 (Konishi et al. hereinafter).

11. In re claim 8 Konishi et al. disclose a turbine rotor shaft, comprising:
a middle region (2) consisting of a middle bloc, having a middle region material and a longitudinal axis and having a first end face oriented perpendicular to the longitudinal axis and arranged at an a first end of the middle region (2) and a second end face arranged at a second end of the middle region (2) opposite the first end face;
a first outer region (1) consisting of a first bloc, having a first material and arranged coaxially with the longitudinal axis abutting the first end face of the middle region (2), comprising a first bearing surface configured to receive a first bearing which mounts the first outer region to the turbine; and
a second outer region (3 & 4) consisting of a second bloc having a second material and

arranged coaxially with the longitudinal axis and abutting the second end face of the middle region, comprising a second bearing surface configured to receive a second bearing which mounts the second outer region to the turbine, wherein the middle region material has a higher heat resistance than the first and second materials (col. 3 lines 24-52).

12. In re claim 9 Konishi et al. disclose the turbine shaft as claimed in claim 8, wherein the first and second outer regions are welded to the middle region (col. 3 lines 24-52).

13. In re claim 14 Konishi et al. disclose a method for manufacturing a turbine shaft, comprising:

producing a middle region (2) from a middle bloc of a heat-resistant material; producing a first outer region (1) from a first bloc of a material that is less heat-resistant than the middle region (2) material, the first outer region comprising a first bearing surface configured to receive a first bearing which mounts the first outer region to a turbine;

producing a second outer region (3) from a second bloc of a material that is less heat-resistant than the middle region material (2), the second outer region comprising a second bearing surface configured to receive a second bearing which mounts the second outer region to the turbine; and

welding the first and second outer regions to opposite ends of the middle region (col. 3 lines 24-52).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 10-13, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konishi et al.

16. In re claims 10-13, 16 and 17 Konishi et al. teaches the turbine shaft as claimed in claim 9, wherein the middle region material is a forging steel having 9 to 12% by weight of chromium (in re claim 10), wherein the first and second outer materials are different (in re claim 11), the turbine shaft as claimed in claim 11 (in re claim 12) and the turbine shaft as claimed in claim 8 (in re claim 13).

17. Konishi et al. do not teach wherein the first and second materials are steels having 1 to 2% by weight of chromium (in re claim 10), wherein the middle region is exposed to steam at 550°C and 250 bar (in re claim 12), wherein the middle region material is nickel based (in re claim 13), the turbine shaft as claimed in claim 13, wherein the first and second materials are steels having 9 to 12% by weight chromium (in re claim 16) or the turbine shaft as claimed in claim 13, wherein the first and second materials are steels having approximately 3.5% by weight of nickel (in re claim 17).

18. Since Applicant has not disclosed that having the first and second materials be steels having 1 to 2% by weight of chromium, the middle region exposed to steam at 550°C and 250 bar, the middle region material being nickel based, the first and second

materials being steels having 9 to 12% by weight chromium or the first and second materials being steels having approximately 3.5% by weight of nickel solves any stated problem or is for any particular purpose above the fact that these limitations reduce the amount of chromium or nickel needed or simply state the conditions of the working environment and it appears that the apparatus of Konishi et al. would perform equally well with the alloys and working conditions as claimed by Applicants, it would have been an obvious matter of design choice to modify the apparatus of Konishi et al. by utilizing the alloys and working conditions as claimed for the purpose of reducing the amount of chromium or nickel.

19. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over USP 6,358,004 (Shiga et al. hereinafter) in view of Konishi et al.

20. In re claim 15 Shiga et al. disclose a steam turbine comprising:
a turbine shaft arranged coaxial with a rotational axis of the turbine wherein the shaft has a middle region having a middle region material and first and second end faces oriented perpendicular to the longitudinal axis of the shaft arranged at opposite ends of the middle region (see the right side of Fig. 8or Fig. 9);
a plurality of blades attached to the first outer and second outer regions of the turbine shaft;
an inner casing (18) surrounding the turbine shaft;
a plurality of vanes attached to an inner surface of the inner casing; and
an outer casing (19) that surrounds the inner casing (Claim 1).

Art Unit: 3745

21. Shiga et al. do not disclose a steam turbine, comprising:

a turbine shaft arranged coaxial with a rotational axis of the turbine wherein the shaft has a middle region consisting of a middle bloc, having a middle region material and first and second end

faces oriented perpendicular to the longitudinal axis of the shaft arranged at opposite ends of the middle region,

a first outer region consisting of a first bloc, the first outer region comprising a first bearing surface configured to receive a first bearing which mounts the first outer region to a turbine, the first outer region having a first material and arranged coaxially with the longitudinal axis abutting the first end face of the middle region, and

a second outer region consisting of a second bloc, the second outer region comprising a second bearing surface configured to receive a second bearing which mounts the second outer region to the turbine, the second outer region having a second material and arranged coaxially with the longitudinal axis and abutting the second end face of the middle region wherein the middle region material has a higher heat resistance than the first and second materials.

22. Konishi et al. disclose a steam turbine, comprising:

a turbine shaft arranged coaxial with a rotational axis of the turbine wherein the shaft has a middle region consisting of a middle bloc, having a middle region material and first and second end faces oriented perpendicular to the longitudinal axis of the shaft arranged at opposite ends of the middle region,

a first outer region consisting of a first bloc, the first outer region comprising a first

bearing surface configured to receive a first bearing which mounts the first outer region to a turbine, the first outer region having a first material and arranged coaxially with the longitudinal axis abutting the first end face of the middle region, and a second outer region consisting of a second bloc, the second outer region comprising a second bearing surface configured to receive a second bearing which mounts the second outer region to the turbine, the second outer region having a second material and arranged coaxially with the longitudinal axis and abutting the second end face of the middle region wherein the middle region material has a higher heat resistance than the first and second materials as discussed above.

23. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Shiga et al. by using a turbine shaft arranged coaxial with a rotational axis of the turbine wherein the shaft has a middle region consisting of a middle bloc, having a middle region material and first and second end faces oriented perpendicular to the longitudinal axis of the shaft arranged at opposite ends of the middle region, a first outer region consisting of a first bloc, the first outer region comprising a first bearing surface configured to receive a first bearing which mounts the first outer region to a turbine, the first outer region having a first material and arranged coaxially with the longitudinal axis abutting the first end face of the middle region, and a second outer region consisting of a second bloc, the second outer region comprising a second bearing surface configured to receive a second bearing which mounts the second outer region to the turbine, the second outer region having a second material

and arranged coaxially with the longitudinal axis and abutting the second end face of the middle region wherein the middle region material has a higher heat resistance than the first and second materials as taught in Konishi et al. for the purposes of increasing heat resistance while decreasing the amount of chromium used.

24. Although no art rejection has been applied to claim 18, patentability is reserved pending Applicant's response to the objections.

Conclusion

25. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron R. Eastman whose telephone number is (571)270-3132. The examiner can normally be reached on Mon-Thu 9:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look can be reached on (571) 272-4820. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Aaron R. Eastman/
Examiner, Art Unit 3745

/Edward K. Look/
Supervisory Patent Examiner, Art Unit 3745